CLAIMS:

1. An enzyme comprising a recombinant polypeptide containing an amino acid sequence selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence, said recombinant polypeptide having alcohol and aldehyde dehydrogenase activity.

2. An enzyme of claim 1, wherein the recombinant polypeptide is a chimeric polypeptide including a combination of at least two amino acid sequences each of said sequences being selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence.

3. An enzyme of claim 1, wherein the enzyme includes at least two recombinant polypeptides in the form of at least one of a homodimer and a heterodimer.

4. A DNA molecule encoding a recombinant polypeptide containing an amino acid sequence selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence.

5. A DNA molecule of claim 4, wherein the DNA molecule is selected from the group consisting of a linear DNA, a circular DNA and an insertion DNA fragment on a chromosome.

6. A recombinant expression vector comprising at least one DNA molecule containing a DNA sequence selected from the group consisting of SEQ ID NO 1, SEQ ID NO 2, SEQ ID NO 3, SEQ ID NO 4, and sequences which contain addition, insertion, deletion and/or substitution of one or more nucleotides in said sequence, said DNA molecule encoding a recombinant polypeptide having an alcohol and aldehyde deydrogenase activity.

7. A recombinant expression vector comprising at least one DNA molecule containing a DNA sequence selected from the group consisting of SEQ ID NO 1, SEQ ID NO 2, SEQ ID NO 3, SEQ ID NO 4, and sequences which contain addition, insertion, deletion and/or substitution of one or more nucleotides in said sequence, said DNA molecule encoding a recombinant polypeptide having an alcohol and aldehyde deydrogenase activity, wherein said at least one DNA molecule is functionally linked to one or more genetic control sequences and is capable of expression of an enzyme including at least one recombinant polypeptide having alcohol and aldehyde dehydrogenase activity.

8. A recombinant expression vector of claim 7 selected from the group consisting of pSSA102R, pSSA'101R, pSSA"102, pSSB103R, pSSAP-B, pSSA/B101R, pSSA/B102R, pSSA/B103R, pSSB/A101R, pSSB/A102R, pSSB/A103R, pSSsA2, pSSsA21, pSSsA22 and pSSsB.

9. An enzyme encoded by at least one DNA molecule of a recombinant expression vector of claim 8.

10. A recombinant organism including the recombinant expression vector of claim 6.

11. A recombinant organism including the at least one DNA molecule of claim 4.

12. A recombinant organism of claim 10, wherein the recombinant organism is selected from the group consisting of microorganisms, mammalian cells and plant cells.

13. A recombinant organism of claim 10, wherein the host cell is a bacterium.

14. A recombinant organism of claim 10, wherein the host cell is selected from the group consisting of *Escherichia coli*, *Pseudomonas putida*, *Acetobacter xylinum*, *Acetobacter pasteurianus*, *Acetobacter aceti*, *Acetobacter hansenii* and *Gluconobacter oxydans*.

15. A recombinant organism of claim 10, wherein the host cell is *Gluconobacter oxydans*.

16. A process for producing a recombinant enzyme having an alcohol and aldehyde dehydrogenase activity comprising:

a) culturing a recombinant organism including an expression vector including at least one DNA molecule encoding a recombinant polypeptide containing an amino acid sequence selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence, in an appropriate culture medium; and

b) recovering said recombinant enzyme.

17. A process for producing an aldehyde product from a substrate comprising the steps of culturing a recombinant organism of claim 10 in a medium containing the substrate,

wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the aldehyde product.

18. A process for producing a ketone product from a substrate comprising the steps of culturing a recombinant organism of claim 10 in a medium containing the substrate, wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the ketone product.

19. A process for producing a carboxylic acid product from a substrate comprising the steps of culturing a recombinant organism of claim 10 in a medium containing the substrate, wherein said substrate is selected from the group consisting of L-sorbose, D-glucose, D-fructose and L-sorbosone, and recovering the carboxylic acid product.

20. A process for producing an aldehyde product from a substrate which comprises incubating a reaction mixture containing an enzyme of claim 1 and said substrate wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the aldeyde product.

21. A process for producing a ketone product from a substrate which compises incubating a reaction mixture containing an enzyme of claim 1 and said substrate wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the ketone product.

22. A process for producing a carboxylic acid product from a substrate which compises incubating a reaction mixture containing an enzyme of claim 1 and said substrate wherein said substrate is selected from the group consisting of L-sorbose, D-glucose, D-fructose and L-sorbosone, and recovering the carboxylic acid product.

23. A process for producing 2-keto-L-gulonic acid from L-sorbose comprising the steps of culturing a recombinant organism of claim 10 in a medium containing L-sorbose and recovering the 2-keto-L-gulonic acid.

24. A process for producing 2-keto-L-gulonic acid from D-sorbitol comprising the steps of culturing a recombinant organism of claim 10 in a medium containing D-sorbitol and recovering the 2-keto-L-gulonic acid.

25. A process for producing 2-keto-L-gulonic acid which comprises:

a) incubating a reaction mixture containing a substrate selected from the group consisting of D-sorbitol and L-sorbose, and a recombinant enzyme including a recombinant polypeptide containing an amino acid sequence selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence, said recombinant polypeptide having alcohol and aldehyde dehydrogenase activity, and

b) converting the substrate to 2-keto-L-gulonic acid.

26. A process for the production of L-ascorbic acid from 2-keto-L-gulonic acid comprising obtaining 2-keto-L-gulonic acid by a process of claim 23 and transforming the 2-keto-L-gulonic acid into L-ascorbic acid.

27. A process for the production of L-ascorbic acid from 2-keto-L-gulonic acid comprising obtaining 2-keto-L-gulonic acid by a process of claim 24 and transforming the 2-keto-L-gulonic acid into L-ascorbic acid.

28. A process for the production of L-ascorbic acid from 2-keto-L-gulonic acid comprising obtaining 2-keto-L-gulonic acid by a process of claim 25 and transforming the 2-keto-L-gulonic acid into L-ascorbic acid.

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